REMARKS

Claims 1-23 are pending in the application. Claim 23 has been amended to correct a typographical error. No new matter has been added by the amendment

Rejection Under 35 U.S.C. § 103(a)

Claims 1-3, 5, 8-12, 14-18, and 21-23 have been rejected over the Venzia et al. and Agarwal et al. This rejection is overcome in view of the following remarks.

In the applicants previous response of December 7, 2009, the applicants described that Agarwal et al. is referenced in the applicants' specification and asserted that Agarwal et al. describe a process in which the implantation profiles of hydrogen (H) and helium (He) are localized to the same depth in the substrate. The Examiner now aknowledges that Agarwal et al. fail to disclose the implantation of He at a different depth than H in a substrate. (Office Action, Pg. 2). Also, in their response December 7, 2009, the applicants pointed out that Venzia et al. describe a process in which hydrogen and helium are implanted to produce an overlapping profile at a depth of 0.4 micrometers. (Response, Pg. 7). The Examiner now asserts that Venzia et al. disclose implanting helium in a substrate, such that the helium resides outside of the weak buried region. (Office Action, Pg. 3). The applicants assert that despite the disclosure by Venzia et al. of implanting hydrogen and helium at different implantation energies, one skilled in the art would not understand the Venzia et al. as teaching any benefit associated with the disparate implantation energies.

The applicants assert that one skilled in the art would understand Venzia et al. to describe an exploratory experimental work in which the degree of lattice damage and blister formation is explored for different processing conditions (See, Abstract). First, Venzia et al. are interested in the amount of substrate damage induced by the implantation of helium. (Venzia et al., Pg. 1386, second full paragraph). In particular, Venzia et al. state that they "have separated the damage induced by He, the co-implanted ion, from the physical effects of the He gas in the following ways. In one set of experiments, He was implanted deeper than H, separating most of the damage from the He implant from the location of the H implant." They further state that "the damage "the He implant played little role in improving the efficiency of the formation of surface

blishters at lower doses." *Id.* Venzia et al. go on to describe other variations such as experiments in which H and He were co-implanted at low temperatures. Venzia et al. further investigated the co-implantation of Li. Accordingly, the applicants assert that Venzia et al. are not focused on improving the efficiency of the process, rather Venzia et al. are simply investigating the effects of varying process parameters in order to better understand the interaction of process parameters with respect to changes in the morphology of the substrate.

Secondly, even where Venzia et al. explore aspects of the process in which helium is implanted to a deeper depth than hydrogen, Venzia et al. note "[s]ince the blistering remained essentially unchanged as a result of placing the He damage deeper than the H damage, we can conclude that the effects of the damage induced by the He did not play a significant role in enhancing the formation of the surface blisters at lower doses." (Venzia et al., Pg. 1388, leading paragraph). The applicants assert that Venzia et al. teach that it is preferable to implant hydrogen and helium to the same depth and the substrate. Venzia et al. conclude that "[t]he presence of He in the region of the H implant was shown to make the process of surface blistering more efficient." (Venzia et al., Pg. 1388). Venzia et al. clearly suggest that implantation of helium and hydrogen is more efficient when carried out at the same implant depth. Accordingly, the applicants assert that one skilled in the art would not find Venzia et al. to suggest that the implantation process disclosed by Agarwal et al. should be modified to implant helium at a greater depth in the substrate then hydrogen. This is at least because Venzia et al. is teaching away from implanting hydrogen and helium at different depths in the substrate.

When the entire description provided by Venzia et al is considered, it is clear that one skilled in the art would not be motivated to combine Venzia et al. and Agarwal et al. in the manner suggested by the Examiner. The applicants assert that all portions of a cited reference must be considered, that which supports a finding of similarity between the reference and the claimed invention, and that which does not. (*See* MPEP §2141.02 VI). Further, given the discouragement of implanting hydrogen and helium at different depths by Venzia et al., the applicants assert that the only place where one skilled in the art would find a suggestion to combine these references is in the

applicants' pending claims. The applicants assert that it is improper to combine references and assert obviousness where the combination originates solely from hindsight reasoning. (*See* MPEP §2142 "impermissible hindsight must be avoided"). The applicants assert that the only place that one skilled in the art would find a suggestion for picking out a non-emphasize, and discouraged relative implantation energy relationship from Venzia et al. comes from the applicants' claims. Accordingly, a *prima facie* case of obviousness has not been established.

Although the Examiner points to the Supreme Court's decision in *KSR International Co. v. Teleflex Inc.* to support the rejection, the applicants assert that the Court did not eliminate consideration of the teaching, suggestion, or motivation test to judge the combination of references to produce a *prima facie* case of obviousness. *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385, 1396 (U.S. 2007*).* *A*ccordingly, the applicants assert that a *prima facie* a case of obviousness is not been established by the cited combination references at least in view of the failure to establish why one skilled in the art would be motivated to combine the teachings of these references in view of the teaching away by Venzia et al. Considering that a number of authors of the cited references are leading experts in the fabrication of semiconductor thin films, if the combination suggested by the Examiner was indeed obvious and would result from some straightforward combination of Venzia et al. and Agarwal et al., the noted absence of such a teaching in the art as of the filing date of the instant application belies the failure of the cited references to suggest the applicants' claims.

Claims 2-3, 5, 8-12, 14-18, and 21-22 depend directly or indirectly from claim 1. As asserted by the applicants in their previous response, these claims add further detailed aspects to the process recited by claim 1. The applicants assert that these claims are allowable at least in view of the foregoing remarks pertaining to claim 1

Claims 4 and 19 have been rejected over Agarwal et al. and Venzia et al., and in view of Duo et al. This rejection is overcome in view of the dependence of claims 2 and 3 from claim 1 together with following remarks.

The applicants previously discussed the rejection of claims 4 and 19 over

Agarwal et al. and Duo et al. (Response, December 7, 2009, Pg. 10-11). The applicants reassert the remarks regarding claims 4 and 19 and Agarwal et al. and Duo et al. The applicants further assert that the addition of the Venzia et al does not overcome the deficiencies of the other references. The applicants assert that none of the cited references suggest or disclose the advantages of the recited order of implantation of the first and second chemical species. The Examiner acknowledges that Agarwal et al. and Venzia et al. fail to suggest or disclose that the second species is implanted before the first species. (Office Action, Pg. 4). The applicants further assert that, regardless of any discussion by Duo et al. of a synergistic effect of hydrogen and helium implantation, there is still no suggestion for the particular recited implant order. This is the least because none of these references even recognize a significant difference in encouraging the growth of microcavities, without at the same time increasing the size of this distributed region at the level of the main peak. (Specification, Pg. 7, ll.,17-24).

Claims 6-7, 13, and 20 and been rejected over Agarwal et al. and Venzia et al. and further in view of JP11087668 to Kinji. This rejection is overcome in view of the following remarks.

The applicants assert that claim 6-7, 13, and 20 are allowable at least in view of their direct or indirect dependence from claim 1. The applicants further note that the Examiner acknowledges that Agarwal et al. and the Venzia et al. fail to disclose initiating a fracture by applying heat treatment (as recited by claim 6), simultaneously defusing at least a portion of the second chemical species and initiating a fracture in addition to a heat treatment (claim 7 and 20), or applying a thickener to the substrate to serve as a support for the thin layer after fracture (claim 13). The applicants assert that the addition of JP' 668 does not overcome the failure of the remaining references to present a *prima facie* case of obviousness.

The applicants' foregoing remarks pertaining to Agarwal et al. and Venzia et al. are incorporated herein. The applicants assert that Kenji discloses a process in which helium and hydrogen are implanted into a substrate followed by applying a support board (12), applying heat, and separating the implanted substrate. (English Abstract).

Again as previously asserted by the applicants, Kenji teach implantation of the chemical species into the same region of the substrate. Accordingly, the applicants assert that the addition of Kinji does not overcome the failure of the primary references to establish a *prima facie* a case of obviousness. The applicants assert that claims 6-7, 13, and 20 are allowable at least in view of their direct or indirect dependence from claim 1.

The applicants have made novel and nonobvious contribution to the art of thin-film semiconductor fabrication. The claims at issue distinguish over the cited references and are in condition for allowance. Accordingly such allowance is now earnestly requested.

Respectfully submitted,

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